ow

United States Patent and Trademark Office

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/658,463	09/08/2000	Kiyohide Satoh	2355.12108	3618

5514 7590 10/30/2006

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER	
WANG, JIN CHENG	
ART UNIT	**PAPER NUMBER**
2628	

DATE MAILED: 10/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	**Application No.** 09/658,463	**Applicant(s)** SATOH ET AL.	
	Examiner Jin-Cheng Wang	**Art Unit** 2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,6-10,15-19,24-29 and 31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 6-10, 15-19, 24-29 and 31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed 9/22/2006 has been entered. Claims 1, 10, 19, and 31 have been amended. Claims 2-5, 11-14, 20-23, 30 and 32 have been canceled. Claims 1, 6-10, 15-19, 24-29 and 31 are pending in the application.

Response to Arguments

Applicant's arguments dated September 22, 2006, with respect to claims 1, 6-10, 15-19, 24-29 and 31 have been considered but are not found persuasive in view of the ground(s) of rejection set forth in the present Office Action based on Daily U.S. Patent No. 6,317,127 (Daily) in view of Ohshima et al. U.S. Patent No. 6,522,312 (Ohshima) and Zsolt Szalavári, Erik Eckstein, Michael Gervautz, "Collaborative Gaming in Augmented Reality", Proceedings of VRST'98, pp.195-204, Taipei, Taiwan (hereinafter Szalavari).

Although Daily does not expressly disclose to the claim limitation that "sensing a video of the real space including a player who is experiencing an augmented reality", Daily discloses displaying a sub-image of <u>the wide FOV video signal</u> to be distributed in real time over the network to a plurality of users 25 in response to the airplane's positioning information (column 4, lines 15-20). Daily discloses that a user controllable viewpoint selector such as a head tracker

for tracking the user's head movement to select a user FOV from the wide FOV video signal (column 5, lines 1-20). In so doing, an image of the user is included in a video of the wide FOV captured by the fish eye lens 172 or geodesic array of sensors 170 (column 11-12). Therefore, Daily discloses a head tracker for recording the user's head movement, which is an image of the player/user that can be included in the user's FOV video for display on the user's HMD.

Ohshima discloses a CCD camera 240 for capturing an image of the player into a pick-up image (e.g., column 18, lines 40-45), the so called marker image (column 13, lines 35-40) and the CCD camera 230 fixed above the center of the table can capture the entire surface of the table within its field of view in which multi-valued image data of the surface of the table **sensed by the TV camera is acquired (wherein the TV camera captured images of the players as well as the virtual pluck and the virtual goal can be viewed by an observer on the TV camera 230 and the camera's field of view selects which players and the virtual objects should be included within its field of view)** and the CCD cameras 240 fixed to the heads of the players acquire marker images which are processed to detect positions of tracked markers falling within the respective fields of view of the individual cameras (column 15, lines 35-40 and column 15, lines 3-10). The two players can observe the surface of the table when they wear the HMDs. The players observe a three-dimensional image displayed on the display screen to be superposed on an image in the real space observed via optical system of the HMDs (column 12, lines 21-30). The changes in posture of the head of the player (an image of the player) are detected by the CCD camera 240 as changes in image sensed by the camera. In Fig. 7, the image as captured by the CCD cameras 240 can be included in a video sensed by the video camera 230 within the image generation units 5050L and 5050R.

Ohshima discloses seeing the game with the virtual pluck and the virtual goal along with the changes in image sensed by the CCD camera 240 in accordance with the changes in posture of the player's heads (See column 13, lines 15-30).

Therefore, having the combined teaching of Daily and Ohshima, one of the ordinary skill in the art would be able to include an image of the player/user in a video of the table or the wide angle FOV. Doing so would allow the customized image generation for a particular player/user (Ohshima Fig. 7 and Daily column 5, lines 1-20).

Daily and Ohshima do not expressly teach the claim limitation of "the observer" and the claim limitation of "first video composition means for composing an augmented reality video viewed from the objective viewpoint position on the basis of the sensed videos of the real space sensed by said first video sensing means and the generated video of the virtual object generated by said first video generation means."

Ohshima implicitly discloses the claim limitation of the observer because Ohshima's system of Figs. 7 and 23 includes the Mallet position measurement 5010, which comprises a computer system Onyx2 from Silicon Graphics, and Position/Posture Measurement 5000, which comprises a computer system Onyx2 from Silicon Graphics. The augmented reality video can be observed from the Onyx2 workstation by an observer. Therefore, Ohshima at least suggests the claim limitation of the observer.

Szalavari expressly discloses the claim limitation of the observer in Fig.2 wherein the VR-hardware components seen from an observer is displayed (See Szalavari Section 3.2) including the superposition of the real object of the players and the virtual object of cards (Szalavari Section 4). Szalavari thus teaches the claim limitation of "first video composition

means for composing an augmented reality video viewed from the objective viewpoint position on the basis of the sensed videos of the real space sensed by said first video sensing means and the generated video of the virtual object generated by said first video generation means."

Therefore, having the combined teaching of Daily, Ohshima and Szalavari, one of the ordinary skill in the art would be able to include an image of the player/user in a video of the table or the wide angle FOV. Doing so would allow the customized image generation for a particular player/user (Ohshima Fig. 7 and Daily column 5, lines 1-20 and Szalavari Fig. 2; Section 3.2 and 4).

Applicants argue that "Applicant submits that an image obtained by composing an image like that of Fig. 2 and a CG, which appears a head in Szalavari with an indication 'view of a player', is not an image from an objective viewpoint" and "Applicants submit that such an image is merely an image from the viewpoint of another player". In response, Szalavari discloses that "Figure 2 shows our VR-hardware components as seen from an observer". It is clear from this teaching that the observer is not participated in the game and the viewed image in Fig. 2 is viewed by an observer as displayed in the tracker server or the game server for non-participants, as opposed to be displayed on the game players' HMD. Szalavari also discloses the claim limitation of the observer because Szalavari's system of Fig. 1 includes the game server and the tracker server which is a computer system having a display wherein the display displaying the game play is observed by the observer other than the players. The augmented reality video can be observed from the game server or the tracker server by an observer. Thus, applicant's

argument that such an image is merely an image from the viewpoint of another player is incorrect.

Applicant further argues that Daily discloses that the camera is mounted on the underside or on top of an airplane, and therefore it captures an image of the external world of the airplane. In response, Daily discloses that a user controllable viewpoint selector such as a head tracker for **tracking the user's head movement** to select a user FOV from the wide FOV video signal (column 5, lines 1-20). In so doing, an image of the user is included in a video of the wide FOV captured by the fish eye lens 172 or geodesic array of sensors 170 (column 11-12). Therefore, Daily discloses a head tracker for recording the user's head movement, which is an image of the player/user that can be included in the user's FOV video for display on the user's HMD.

Ohshima implicitly discloses the claim limitation of the observer because Ohshima's system of Figs. 7 and 23 includes the Mallet position measurement 5010, which comprises a computer system Onyx2 from Silicon Graphics, and Position/Posture Measurement 5000, which comprises a computer system Onyx2 from Silicon Graphics. The augmented reality video can be observed from the Onyx2 workstation by an observer. Therefore, Ohshima at least suggests the claim limitation of the observer.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 19 and 24-27 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 19 and 24-27:

Claim 19 recites storage medium storing a program code. The claimed medium is not necessarily a computer readable medium. The claimed program code is not necessarily computer executable instructions. There is no structural and functional interrelationship between the software and the rest of the computer to permit the instructions' functionality to be realized. Claim 19 is, thus, non-statutory.

Additionally, the claim 19 does not include a computer to execute the claimed program code, the claimed program code is merely a set of instructions capable of being executed by a computer, the claimed program code itself is not a process. Thus, claim 19 is also non-statutory for this reason.

The claims 24-27 are subject to the same rationale of rejection set forth in the claim 19.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 6-10, 15-19, 24-29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daily U.S. Patent No. 6,317,127 (Daily) in view of Ohshima et al. U.S. Patent No. 6,522,312 (Ohshima) and Zsolt Szalavári, Erik Eckstein, Michael Gervautz, "Collaborative Gaming in Augmented Reality", Proceedings of VRST'98, pp.195-204, Taipei, Taiwan (hereinafter Szalavari).

1. Claim 1:

Daily teaches an augmented reality presentation apparatus for superimposing a virtual object in a real space, characterized by comprising:

Objective viewpoint augmented reality presentation means for presenting an augmented reality view viewed from an objective viewpoint position, which differs from a viewpoint position of any player (*e.g., figure 1, 9-10; column 3-5; column 10-12*),

wherein (*Examiner notes: **Language that suggests or makes optional** but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation*) said objective viewpoint augmented reality presentation means includes

First video sensing means for sensing a video of the real space, including a player who is experiencing an augmented reality, viewed from the objective viewpoint position (*e.g., CCD cameras or a multi-sensor system 152 attached to the underside of the airplane to image the hemisphere below the plane, the GPS 154 providing the plane's current position in coordinates and a second sensor array placed on top of the airplane for viewing star constellations; figure 1, 9-10; column 3-5; column 10-12. Daily discloses displaying a sub-image of the wide FOV video*

signal to be distributed in real time over the network to a plurality of users 25 in response to the airplane's positioning information (column 4, lines 15-20). Daily discloses that a user controllable viewpoint selector such as a head tracker for tracking the user's head movement to select a user FOV from the wide FOV video signal (column 5, lines 1-20). In so doing, an image of the user is included in a video of the wide FOV captured by the fish eye lens 172 or geodesic array of sensors 170 (column 11-12). Therefore, Daily discloses a head tracker for recording the user's head movement, which is an image of the player/user that can be included in the user's FOV video for display on the user's HMD);

First video generation means for generating a video of the virtual object viewed from the objective viewpoint position (*e.g., In column 3-4, the reference teaches that the augmented reality system includes a plurality of image sources generating respective video signals as sensed by the CCD cameras that sense real imagery and a wide FOV video signal is generated by the synthesizing the plurality of video signals and the positioning system provides the plane's latitude, longitude and altitude and then the positioning information will be stored and registered to the signal. The generated video of the virtual sphere wherein the source processor 16 includes individual channel processors 18 that group the pixels into packets and a multiplexer 20 that multiplexes the packets into a wide FOV video signal 2, i.e., video of real space. A source processor 16 includes individual channel processors 18 that group the pixels into packets and a multiplexer 20 that multiplexes the packets into a wide FOV video signal 22 and the overlay distribution processor 24 interacts with the positioning system 32, the database 30 to determine which overlay symbols and audio tracks lie within the current wide FOV and the subimage*

capture unit 50 downloads the data from the view and overlay distribution buses 24 and 26 and stores it in a buffer; figure 1, 9-10; column 3-5; column 10-12);

First video composition means for composing an augmented reality video viewed from the objective viewpoint position on the basis of the sensed videos of the real space sensed by said first video sensing means and the generated video of the virtual object generated by said first video generation means (*e.g., In column 3-4, the reference teaches that the augmented reality system includes a plurality of image sources generating respective video signals as sensed by the CCD cameras that sense real imagery and a wide FOV video signal is generated by the synthesizing the plurality of video signals and the positioning system provides the plane's latitude, longitude and altitude and then the positioning information will be stored and registered to the signal to produce the virtual sphere. The generated video of the virtual sphere wherein the source processor 16 includes individual channel processors 18 that group the pixels into packets and a multiplexer 20 that multiplexes the packets into a wide FOV video signal 2, i.e., video of real space, and the overlay distribution processor 24 interacts with the positioning system 32, the database 30 to determine which overlay symbols and audio tracks, i.e., video of virtual space, lie within the current wide FOV and the subimage capture unit 50 downloads the data from the view and overlay distribution buses 24 and 26 and stores it in a buffer; figure 1, 9-10; column 3-5; column 10-12*), and

Objective viewpoint video display means for displaying the composed augmented reality video composed by said first video composition means on a screen of an observer's display apparatus, the observer's display apparatus being separate from a head-mounted display worn by any player (*e.g., the multiplexer 20 that multiplexes the packets into a wide FOV video signal 22*

and the overlay distribution processor 24 interacts with the positioning system 32, the database 30 to determine which overlay symbols and audio tracks lie within the current wide FOV and the subimage capture unit 50 downloads the data from the view and overlay distribution buses 24 and 26 and stores it in a buffer; ***A viewpoint display unit 52*** *reads out the video and overlay data from the buffer for the current user FOV and transmits the subimage to the HMD wherein the display 52, which meets the claim limitation of "an observer's display apparatus", is separate and different from the display within HMD; see figure 1, 9-10; column 3-5; column 10-12;* ***The video signal 22, including the video of real space and the video of virtual space, is broadcast over a video distribution channel 24 such as a network to a plurality of users 25***);

wherein (*Examiner notes:* ***Language that suggests or makes optional*** *but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation*) said apparatus further comprises:

Player's viewpoint augmented reality presentation means for presenting an augmented reality view viewed from a player's viewpoint (e.g., *figure 1, 9-10; column 3-5; column 10-12*);

wherein (*Examiner notes:* ***Language that suggests or makes optional*** *but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation*) said player's viewpoint augmented reality presentation means includes

A head-mounted display having a screen (*e.g., HMD for displaying the user's local FOV; figure 1, 9-10; column 3-5; column 10-12*);

Second video sensing means for sensing a video of the real space viewed from the player's viewpoint position (*e.g., an external stereo camera setup slaved to the user's head*

movement so that the cameras track his head movement and provide the desired view of the surroundings; column 1; and the tracking device 164 such as an RF beacon or a gyro compass to follow the user's head movement and output coordinates that define the users FOV, or the viewpoint position; figure 1, 9-10; column 3-5; column 10-12);

Player's viewpoint position acquiring means for acquiring information indicating the player's viewpoint position (*e.g., an external stereo camera setup slaved to the user's head movement so that the cameras track his head movement and provide the desired view of the surroundings; column 1; and the tracking device 164 such as an RF beacon or a gyro compass to follow the user's head movement and output coordinates that define the users FOV, or the viewpoint position; figure 1, 9-10; column 3-5; column 10-12*);

Second video generation means for generating a video of the virtual object viewed from the player's viewpoint position using the information indicating the player's view position (*e.g., the distribution processor 24 uses the position and heading information including the appropriate geographical range, class and hierarchical levels of symbols and audio tracks for each user to obtain a subimage 42 of the wide FOV video signal 22; figure 1, 9-10; column 3-5; column 10-12*);

Second video composition means for composing an augmented reality video viewed from the player's viewpoint position on the basis of the sensed videos of the real space sensed by said second video sensing means and the generated video of the virtual object generated by said second video generation means (*e.g., <u>in response to user's FOV, user's focal length, user's GPS coordinates, etc., column 11, wherein the player's viewpoint position is determined</u>, each passenger wears a HMD to view a subimage 161 of the wide FOV video signal and the*

passengers look around inside the virtual sphere to select and view a certain portion of the wide FOV. A zoom controller 168 allows the passenger to zoom in and out on the video signal. Moreover, the distribution processor 24 uses the position and heading information including the appropriate geographical range, class and hierarchical levels of symbols and audio tracks for each user to obtain a subimage 42 of the wide FOV video signal 22; figure 1, 9-10; column 3-5; column 10-12); and

Player's viewpoint video display means (*e.g., HMD for displaying the user's local FOV; figure 1, 9-10; column 3-5; column 10-12*) for displaying the composed augmented reality video composed by said second video composition means on the screen of said head-mounted display (*e.g., in response to user's FOV, user's focal length, user's GPS coordinates, etc., column 11, wherein the player's viewpoint position is determined, each passenger wears a HMD to view a subimage 161 of the wide FOV video signal and the passengers look around inside the virtual sphere to select and view a certain portion of the wide FOV. A zoom controller 168 allows the passenger to zoom in and out on the video signal. Moreover, the distribution processor 24 uses the position and heading information including the appropriate geographical range, class and hierarchical levels of symbols and audio tracks for each user to obtain a subimage 42 of the wide FOV video signal 22; figure 1, 9-10; column 3-5; column 10-12*), wherein said head-mounted display includes said second video sensing means (*e.g., an external stereo camera setup slaved to the user's head movement so that the cameras track his head movement and provide the desired view of the surroundings; column 1; and the tracking device 164 such as an RF beacon or a gyro compass to follow the user's head movement and output coordinates that define the users FOV, or the viewpoint position; figure 1, 9-10; column 3-5; column 10-12*) and

said player's viewpoint video display means, and is worn by a player (*e.g., HMD for displaying the user's local FOV; figure 1, 9-10; column 3-5; column 10-12*).

Although Daily does not expressly disclose to the claim limitation that "sensing a video of the real space including a player who is experiencing an augmented reality", Daily discloses displaying a sub-image of the wide FOV video signal to be distributed in real time over the network to a plurality of users 25 in response to the airplane's positioning information (column 4, lines 15-20). Daily discloses that a user controllable viewpoint selector such as a head tracker for tracking the user's head movement to select a user FOV from the wide FOV video signal (column 5, lines 1-20). In so doing, an image of the user is included in a video of the wide FOV captured by the fish eye lens 172 or geodesic array of sensors 170 (column 11-12). Therefore, Daily discloses a head tracker for recording the user's head movement, which is an image of the player/user that can be included in the user's FOV video for display on the user's HMD.

Ohshima discloses a CCD camera 240 for capturing an image of the player into a pick-up image (e.g., column 18, lines 40-45), the so called marker image (column 13, lines 35-40) and the CCD camera 230 fixed above the center of the table can capture the entire surface of the table within its field of view in which multi-valued image data of the surface of the table **sensed by the TV camera is acquired (wherein the TV camera captured images of the players as well as the virtual pluck and the virtual goal can be viewed by an observer on the TV camera 230 and the camera's field of view selects which players and the virtual objects should be included within its field of view)** and the CCD cameras 240 fixed to the heads of the players acquire marker images which are processed to detect positions of tracked markers falling within the respective fields of view of the individual cameras (column 15, lines 35-40 and column 15,

lines 3-10). The two players can observe the surface of the table when they wear the HMDs. The players observe a three-dimensional image displayed on the display screen to be superposed on an image in the real space observed via optical system of the HMDs (column 12, lines 21-30). The changes in posture of the head of the player (an image of the player) are detected by the CCD camera 240 as changes in image sensed by the camera. In Fig. 7, the image as captured by the CCD cameras 240 can be included in a video sensed by the video camera 230 within the image generation units 5050L and 5050R.

Ohshima discloses seeing the game with the virtual pluck and the virtual goal along with the changes in image sensed by the CCD camera 240 in accordance with the changes in posture of the player's heads (See column 13, lines 15-30).

Therefore, having the combined teaching of Daily and Ohshima, one of the ordinary skill in the art would be able to include an image of the player/user in a video of the table or the wide angle FOV. Doing so would allow the customized image generation for a particular player/user (Ohshima Fig. 7 and Daily column 5, lines 1-20).

Daily and Ohshima do not expressly teach the claim limitation of "the observer" and the claim limitation of "first video composition means for composing an augmented reality video viewed from the objective viewpoint position on the basis of the sensed videos of the real space sensed by said first video sensing means and the generated video of the virtual object generated by said first video generation means."

Ohshima implicitly discloses the claim limitation of the observer because Ohshima's system of Figs. 7 and 23 includes the Mallet position measurement 5010, which comprises a computer system Onyx2 from Silicon Graphics, and Position/Posture Measurement 5000, which

comprises a computer system Onyx2 from Silicon Graphics. The augmented reality video can be observed from the Onyx2 workstation by an observer. Therefore, Ohshima at least suggests the claim limitation of the observer.

Szalavari expressly discloses the claim limitation of the observer in Fig.2 wherein the VR-hardware components seen from an observer is displayed (See Szalavari Section 3.2) including the superposition of the real object of the players and the virtual object of cards (Szalavari Section 4). Szalavari thus teaches the claim limitation of "first video composition means for composing an augmented reality video viewed from the objective viewpoint position on the basis of the sensed videos of the real space sensed by said first video sensing means and the generated video of the virtual object generated by said first video generation means."

Therefore, having the combined teaching of Daily, Ohshima and Szalavari, one of the ordinary skill in the art would be able to include an image of the player/user in a video of the table or the wide angle FOV. Doing so would allow the customized image generation for a particular player/user (Ohshima Fig. 7 and Daily column 5, lines 1-20 and Szalavari Fig. 2; Section 3.2 and 4).

Claim 6:

The apparatus according to claim 1, characterized in that parameters of said first video sensing means are known, and said first video generation means generates the video of the virtual object viewed from said first viewpoint position in accordance with the known parameters.

Claim 6 recites all the limitations of claim 1 and adds the limitation of "the known parameters." Daily teaches the known parameters such as the focal length of the CCD video camera and measured plane's coordinates by GPS sensors, and input parameters such as the desired resolution, the object's focal length, orientation and Cartesian coordinates on the object's image plane where the object is either the image source or the user display (*figure 1, 9-10; column 3-5; column 7-12*).

Claim 7:

The apparatus according to claim 1, characterized in that some of parameters of said first video sensing means are variable, said apparatus further comprises measurement means for measuring changes of the parameters, and said objective video generation means generates the video of the virtual object viewed from said first viewpoint position in accordance with the parameters measured by said measurement means.

Claim 7 recites all the limitations of claim 1 and adds the limitation of "variable parameters" and "measurement means." Daily teaches measuring the plane's positions are variables of the plane's coordinates in which the coordinate values are measured by the GPS sensors (*figure 1, 9-10; column 3-5; column 7-12*).

Claim 8:

The apparatus according to claim 7, characterized in that the parameters of said first video sensing means measured by said measurement means include at least one of a viewpoint position/posture, and zoom ratio.

Claim 8 recites all the limitations of claim 7 and adds the limitation of "position/posture information." Daily teaches the plane's positions are variables of the plane's coordinates which determine the position/posture of the CCD video cameras and the zoom ratios are determined by the zooming in and out parameters inputted by the user. Daily also teaches generating and correcting view position and posture of the passengers (*figure 1, 9-10; column 3-5; column 7-12*).

Claim 9:

The apparatus according to claim 1, characterized in that when a plurality of first video sensing means equivalent to said first video sensing means are present, said apparatus further comprises selection means for receiving a plurality of videos of the real space from said objective viewpoint position from the plurality of first video sensing means, and outputting a video of the real space viewed from said objective viewpoint position from one selected first video sensing means to said first video composition means, and said first video composition means generates a video of the virtual object viewed from said objective viewpoint position using parameters of the first video sensing means selected by said selection means.

Claim 9 recites all the limitations of claim 1 and adds the limitation of "selection means for receiving a plurality of first video sensing means."

Daily teaches selecting of the image regions as captured by a plurality of video cameras by zooming in and out the video scene in the real space. Daily also teaches a plurality of video cameras for sensing a scene below or around the plane where image signals that represent an

environment scene of a real space and the user's zooming in and out video scene (*figure 1, 9-10; column 3-5; column 7-12*).

2. Claim 10:

The claim 10 is a rephrasing of the claim 1 in a method form. The claim is rejected for the same reason as set forth in claim 1.

Claim 15:

The method according to claim 10, characterized in that parameters of said first video sensing means are known, and said first video generation step includes the step of generating the video of the virtual object viewed from said objective viewpoint position in accordance with the known parameters.

Claim 15 recites all the limitations of claim 10 and adds the limitation of "the known parameters." Daily teaches the known parameters such as the focal length of the CCD video camera and measured plane's coordinates by GPS sensors, and the video scenes can be adjusted in accordance to the desired resolution, the object's focal length, orientation and Cartesian coordinates on the object's image plane where the object is either the image source or the user display (*figure 1, 9-10; column 3-5; column 7-12*).

Claim 16:

The method according to claim 10, characterized in that some of parameters of means for sensing a video viewed from said first viewpoint position are variable, said method further comprises the measurement step of measuring changes of the parameters, and said first video generation step includes the step of generating the video of the virtual object viewed from said objective viewpoint position in accordance with the parameters measured in the measurement step.

Claim 16 recites all the limitations of claim 10 and adds the limitation of "variable parameters" and "measurement step." Daily teaches measuring the plane's coordinates which are variables as plane moves. Daily further teaches correcting view position and posture of the passengers and zooming in and out the video scene (*figure 1, 9-10; column 3-5; column 7-12*).

Claim 17:

The method according to claim 16, characterized in that the parameters of the means for sensing a video viewed from said objective viewpoint position measured in the measurement step include at least one of a viewpoint position/posture, and zoon ratio.

Claim 17 recites all the limitations of claim 16 and adds the limitation of "position/posture information." Daily teaches the plane's positions are variables of the plane's coordinates which determine the position/posture of the CCD video cameras and the zoom ratios are determined by the zooming in and out parameters inputted by the user. Daily also teaches generating and correcting view position and posture of the passengers (*figure 1, 9-10; column 3-5; column 7-12*).

Claim 18:

The method according to claim 10, characterized in that when a plurality of means for sensing a video viewed from said objective viewpoint position are present, said method further comprises the selection step of receiving a plurality of videos of the real space viewed from an objective viewpoint position from the plurality of means for sensing a video viewed from said objective viewpoint position, and outputting the video of the real space viewed from an objective viewpoint position input from one selected means for sensing a video of said objective viewpoint position to means for compositing an objective viewpoint video, and said first video composition step includes the step of generating a video of the virtual object viewed from said objective viewpoint position using parameters of the means for sensing a video viewed from an objective viewpoint position selected in the selection step.

Claim 18 recites all the limitations of claim 10 and adds the limitation of "selection step for receiving a plurality of videos."

Daily teaches selecting of the image regions as captured by a plurality of video cameras by zooming in and out the video scene in the real space. Daily also teaches a plurality of video cameras for sensing a scene below or around the plane where image signals that represent an environment scene of a real space and the user's zooming in and out video scene (*figure 1, 9-10; column 3-5; column 7-12*).

3. Claims 28-29:

Referring to claims 28-29, Daily discloses a mixed reality presentation system that generates and presents a virtual image in a real space (*figure 1, 9-10; column 3-5; column 10-12*). However, the reference is silent on a printing means in connection to the mixed reality presentation apparatus. It is common that a computer system has a printing means attached to them. Therefore, it would have been obvious to one having ordinary skill in the art to have incorporated a printing means in the mixed reality presentation apparatus of Daily because such construction is rather conventional. A person of ordinary skill in the art would be motivated to have incorporated a printing means to the Daily's mixed reality presentation apparatus to further provide a paper copy of still images of the real images that have been displayed on the display devices of Daily.

4. Claim 31:

The claim 31 encompasses the same scope of invention as that of claim 1. The claim is subject to the same reasons set forth in claim 1.

Claims 19 and 24-27 rejected under 35 U.S.C. 103(a) as being unpatentable over Daily U.S. Patent No. 6,317,127 (Daily) in view of Ohshima et al. U.S. Patent No. 6,522,312 (Ohshima) and Zsolt Szalavári, Erik Eckstein, Michael Gervautz, "Collaborative Gaming in Augmented Reality", Proceedings of VRST'98, pp.195-204, Taipei, Taiwan (hereinafter Szalavari), Latypov U.S. Patent No. 6,624,853 (Latypov) and Sato U.S. Patent No. 6,445,815 (hereinafter Sato).

5. Claim 19:

(1) The claim 19 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of "a storage medium storing a program code.

(2) It is unclear whether Daily, Ohshima and Szalavari have implicitly taught a storage medium storing a program code.

(3) However, Sato discloses the claimed limitation of a storage medium that stores an image processing program, which is implemented on a computer and continuously presents three-dimensional images to an observer/player, storing a program code of an augmented reality, a depth estimation program code, a depth image generation program code, a position/posture information estimation program code, a warping program code and a program code of presenting to the observer three-dimensional images. The Sato reference implicitly teaches a program code including the augmented reality presentation step of generating and presenting a virtual image in a real space in which an image of merged real objects and virtual objects are displayed in LCDs 103 in an optical see-through head mounted device (column 1, lines 13-23). The Sato reference also implicitly teaches a position/posture estimation module 201 that outputs three-dimensional motions from a viewpoint position of the camera to right and left viewpoint positions of the player (column 12, lines 54-65). The Sato reference further teaches a depth image generation module 300 that uses position/posture information input from the position/posture estimation module 201 as that for CG rendering and which generates an augmented reality image using the three-dimensional CG database in accordance with the distance to an object in the real world expressed by the depth image and presents it on the LCDs 103 (column 12, lines 44-50) and a depth warping module 203 to inversely project a depth image ID acquired at a viewpoint having

position/posture information into a space, and to re-project it onto the imaging plane of the virtual camera with the focal length of the virtual camera assumed at the viewpoint having an estimated position/posture value by the viewpoint position/posture module 201 (column 13, lines 32-48).

(4) Daily at least suggests program codes illustrated in a variety of flow charts (Figs. 5-9).

(5) One having the ordinary skill in the art would have been motivated to do this because it would have provided the installation and implementation of the image processing on other systems.

Claim 24:

The medium according to claim 19, characterized in that parameters of means for sensing said objective viewpoint video are known, and the program code of said first video generation step includes the step of generating the video of the virtual object viewed from said objective viewpoint position in accordance with the known parameters.

Claim 24 recites all the limitations of claim 19 and adds the limitation of "the known parameters." Daily teaches the known parameters such as the focal length of the CCD video camera and measured plane's coordinates by GPS sensors, and the video scenes can be adjusted in accordance to the desired resolution, the object's focal length, orientation and Cartesian coordinates on the object's image plane where the object is either the image source or the user display (*figure 1, 9-10; column 3-5; column 7-12*).

Claim 25:

The medium according to claim 19, characterized in that some of parameters of means for sensing a video viewed from said objective viewpoint position are variable, the program code of said medium further comprises the measurement step of measuring changes of the parameters, and the program code of said first video generation step includes the step of generating the video of the virtual object viewed from said objective viewpoint position in accordance with the parameters measured in the measurement step.

Claim 25 recites all the limitations of claim 19 and adds the limitation of "variable parameters" and "measurement step." Daily teaches measuring the plane's coordinates which are variables as plane moves. Daily further teaches correcting view position and posture of the passengers and zooming in and out the video scene (*figure 1, 9-10; column 3-5; column 7-12*).

Claim 26:

The medium according to claim 25, characterized in that the parameters of the means of sensing a video viewed from said objective viewpoint position measured in the measurement step include at least one of a viewpoint position/posture, and zoon ratio.

Claim 26 recites all the limitations of claim 25 and adds the limitation of "position/posture information." Daily teaches the plane's positions are variables of the plane's coordinates which determine the position/posture of the CCD video cameras and the zoom ratios are determined by the zooming in and out parameters inputted by the user. Daily also teaches generating and correcting view position and posture of the passengers (*figure 1, 9-10; column 3-5; column 7-12*).

Claim 27:

The medium according to claim 19, characterized in that when a plurality of means for sensing a video viewed from said objectivet viewpoint position are present, said medium further comprises a program code of the selection step of receiving a plurality of videos of the real space viewed from an objective viewpoint position from the plurality of means for sensing a video viewed from said objective viewpoint position, and outputting the video of the real space viewed from an objective viewpoint position input from one selected means for sensing a video of said objective viewpoint position to means for compositing an objective viewpoint video, and the program code of said first video composition step includes the step of generating a video of the virtual object viewed from said objective viewpoint position using parameters of the means for sensing a video viewed from an objective viewpoint position selected in the selection step.

Claim 27 recites all the limitations of claim 19 and adds the limitation of "selection step for receiving a plurality of videos."

Daily teaches selecting of the image regions as captured by a plurality of video cameras by zooming in and out the video scene in the real space. Daily also teaches a plurality of video cameras for sensing a scene below or around the plane where image signals that represent an environment scene of a real space and the user's zooming in and out video scene (*figure 1, 9-10; column 3-5; column 7-12*).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jin-Cheng Wang whose telephone number is (571) 272-7665. The examiner can normally be reached on 8:00 - 6:30 (Mon-Thu).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung can be reached on (571) 272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

jcw

KEE M. TUNG
SUPERVISORY PATENT EXAMINER